IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	Confirmation No.: **4784**
Darel N. Emmot	Group Art Unit: **2145**
Serial No.: **10/633,104**	Examiner: **Swearingen, Jeffery R**
Filed: **August 1, 2003**	Docket No.: **10001767-1**

For: **SYSTEM AND METHOD FOR ROUTING INFORMATION IN A NODAL COMPUTER NETWORK**

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief under 37 C.F.R. § 41.37 is submitted in support of the Notice of Appeal filed on October 15, 2008, responding to the final Office Action mailed September 4, 2008.

It is not believed that extensions of time or fees are required to consider this Appeal Brief. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. §1.136(a), and any fees required therefor are hereby authorized to be charged to Deposit Account No. 08-2025.

I. Real Party in Interest

The real party in interest is Hewlett-Packard Development Company, L.P., a limited partnership established under the laws of the State of Texas and having a principal place of business at 11445 Compaq Center Drive West Houston, TX 77707, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. Related Appeals and Interferences

There are no known related appeals or interferences.

III. Status of Claims

Claims 1-22 stand finally rejected by the final Office Action mailed September 4, 2008, and are the subject of this appeal.

IV. Status of Amendments

No amendments have been made subsequent to the final Office Action mailed September 4, 2008. The claims in the attached Claims Appendix (see below) reflect the present state of Appellants' claims.

V. Summary of Claimed Subject Matter

The claimed inventions are summarized below with reference numerals and references to the written description ("specification") and drawings. The subject matter described in the following appears in the original disclosure at least where indicated, and may further appear in other places within the original disclosure.

Embodiments of the invention, such as those defined by claim 1 define, in a multi-node network (see e.g., FIG. 2 and specification p. 5, lines 20-22) comprising a plurality of distributed switching nodes (*see e.g.*, FIGs 2 and 4, reference number 100, and related portions of the specification including p. 5, line 22), a method implemented in at least one of the plurality of distributed switching nodes for routing information entering the at least one of the plurality of distributed switching nodes over a first channel to one of a plurality of other channels (see e.g., FIG. 6 and related portions of the specification), the method comprising: obtaining priority information for the information (see e.g., reference number 321, and the specification p. 12, lines 18-19); ascertaining a remaining communication length for the information for each of the plurality of other channels (see e.g., reference number 324, and the specification p. 12, lines 20-21); determining a current demand for each of the plurality of other channels (see e.g., reference number 325, and the specification p. 12, lines 21-22); and routing the information entering at the first channel to one of the plurality of other channels (see e.g., reference number 328, and the specification p. 13, lines 1-2) based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels (*see e.g.,* p.7, lines 6-10).

Embodiments of the invention, such as those defined by claim 17 define, in a multi-node network (see e.g., FIG. 2 and specification p. 5, lines 20-22) comprising a plurality of distributed switching nodes (*see e.g.*, FIGs 2 and 4, reference number 100, and related portions of the specification including p. 5, line 22), a method implemented in at least one of the plurality of

distributed switching nodes for routing information out of the at least one of the plurality of distributed switching nodes over a first channel from one of a plurality of other channels (see e.g., FIG. 7 and related portions of the specification), the method comprising: obtaining priority information for the information entering the node for each of the plurality of other channels (see e.g., reference number 421, and the specification p. 13, lines 5-6); ascertaining a remaining communication length for the information entering the node for each of the plurality of other channels (see e.g., reference number 424, and the specification p. 13, lines 6-8); determining a current demand of the first channel (see e.g., reference number 425, and the specification p. 13, lines 6-7); and routing the information entering at one of the other channels to the first channel (see e.g., reference number 428, and the specification p. 13, line 13) based upon an evaluation that considers a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel (*see e.g.,* p.7, lines 6-10).

Embodiments of the invention, such as those defined by claim 21 define a computer readable medium encoded with instructions executable by a processing element node (*see e.g.*, FIGs 2 and 4, reference number 100, and related portions of the specification including p. 5, line 22 and p. 8, lines 8-9) for routing information entering the node over a first channel (*see e.g.*, reference number 102 and p. 6, lines 24-25) to one of a plurality of other channels (*see e.g.*, reference numbers 104, 105, 106, and 108, p. 6 line 25 through p. 7, line 1) in a multi-node network comprising a plurality of distributed switching nodes, the instructions comprising: logic (see e.g., reference numbers 121-123 and p. 8, line 23 through p. 9, line 3) configured to obtain priority information for the information; logic (see e.g., reference number 124 and p. 9, lines 3-10) configured to ascertain a remaining communication length for the information for each of the plurality of other channels; logic (see e.g., reference number 125 and p. 9, lines 13-17) configured to determine a current demand for each of the plurality of other channels; and logic (see e.g., reference number 126 and p. 9, lines 18-19) configured to route the information

entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels (*see e.g.,* p.7, lines 6-10).

VI. Grounds of Rejection to be Reviewed on Appeal

The following grounds of rejections are to be reviewed on appeal:

A. Claims 1-22 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by *Douglas et al.* (U.S. Patent No. 5,530,809, hereafter "*Douglas*").

VII. Arguments

For the reasons that follow, Appellants request that the rejections of claims 1-22 be overturned.

A. Rejection of Claims 1-22 under 35 U.S.C. §102(b): *Douglas*

1. Appellants' Claim 1

Appellant's claim 1 provides as follows (emphasis added):

> In a multi-node network comprising a plurality of distributed switching nodes, a method implemented in at least one of the plurality of distributed switching nodes for routing information entering the at least one of the plurality of distributed switching nodes over a first channel to one of a plurality of other channels, the method comprising:
> ***obtaining priority information for the information***;
> ***ascertaining a remaining communication length for the information for each of the plurality of other channels***;
> ***determining a current demand for each of the plurality of other channels***; and
> ***routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels***.

Appellant respectfully submits that independent claim 1 is allowable for at least the reason that *Douglas* does not disclose, teach, or suggest at least the features recited and emphasized above in claim 1.

(a) *Douglas* does not disclose *"obtaining priority information for the information ..."*

The Office Action alleges "Douglas disclosed: *obtaining priority information for the information;* column 108, lines 9-42" (Office Action at page 3; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> The node control circuit 1004 receives selected signals from and generates various control signals in response. For example, the node control circuit 1004 receives binary-encoded HEIGHT (2:0) signals which identify the level of the data router node 22(i,j,k) and generates DECR HGT decremented height signals which are binary encoded to identify the next lower level in the data router 15. As described above, as the data router nodes 22(i,j,k) transfer the data router message packets 30 down the data router 15, the nodes decrement the value contained in the header field 40, which identifies the level. In that case, the DECR HGT decremented height signals are used to form the contents of the header field 40, as described below.
>
> In addition, the node control circuit 1004 receives the AFD (i,j) all-fall-down (i,j) signal from the control network 14 and generates, in response thereto, an AFD MODE all-fall-down mode signal which controls operations in the child interface modules 1001(i) and the parent interface modules 1002(i) as described below. The node control circuit also generates an EN enable signal, which enables the data router node 22(i,j,k) to operate, and P3:P0/C3:C0 DIS parent interface module/child interface module disable signals that disable selected ones of the child interface modules 1001(i) and parent interface modules 1002(i).
>
> The node control circuit 1004 also generates a set of CHILD MAP signals which are coupled to the child interface modules 1001(i) and parent interface modules 1002(i) and are used to force the association of each of the modules 1001(i) and 1002(i) with a particular the child interface module 1001(i) during while the AFD MODE all-fall-down mode signal is asserted. This forces the switch 103 to couple data router message packets 30 received from a particular source, a particular parent or child, to a particular child interface module 1001(i).

(*Douglas* at col. 108, lines 9-42). The Office Action further alleges in the response to arguments section on page 2 that "the HEIGHT signals indicated the level of the data router node to transmit information to." As such, the Office Action appears to allege that the HEIGHT

corresponds to priority and appears to point to the node coordinates in support. In addition, it appears that the Office Action is alleging that receiving corresponds to "obtaining" as recited in claim 1. While *Douglas* discloses "HEIGHT (2:0) signals which identify the level of the data router node 22(i,j,k)" (col. 108, lines 12-13; emphasis added), *Douglas* does not teach or suggest that the HEIGHT signals are "priority information for the information" as recited in claim 1. Nor does *Douglas* disclose or suggest that the node coordinates indicate "priority information for the information".

The Office Action further alleges in the response to arguments section on page 2 that "Douglas, column 108, lines 33-42 further indicates a CHILD MAP signal which forces the association of a module in order to couple packets with a child module – in effect, 'a general indicator related to the urgency of the message, or the need to reach the destination in a timely fashion.'" Specifically, the cited section of *Douglas* teaches:

> The node control circuit 1004 also generates a set of CHILD MAP signals which are coupled to the child interface modules 1001(i) and parent interface modules 1002(i) and are used to force the association of each of the modules 1001(i) and 1002(i) with a particular the child interface module 1001(i) during while the AFD MODE all-fall-down mode signal is asserted. This forces the switch 103 to couple data router message packets 30 received from a particular source, a particular parent or child, to a particular child interface module 1001(i).

(*Douglas* at col. 108, lines 33-42). Appellant respectfully submits that a signal that forces a switch to couple message packets received from a particular source to a particular module is not the same as "priority information for the information" as recited in claim 1. Thus, *Douglas* does not disclose or suggest "obtaining priority information for the information" as recited in claim 1.

(b) ***Douglas* does not disclose *"ascertaining a remaining communication length for the information for each of the plurality of other channels ..."***

The Office Action alleges "Douglas disclosed... *ascertaining a remaining communication length for the information for each of the plurality of other channels;* column 108, lines 47-56"

(Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> Each child interface module 1001(i) includes an input child circuit, generally identified by reference numeral 1006(i), and an output child circuit generally identified by reference numeral 1007(i). The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel. The C"i" IN FLIT signals received at successive ticks of the NODE CLK signal represent four-bit flits of the data router message packet 30 from the child connected thereto.

(*Douglas* at col. 108, lines 47-56). The Office Action further alleges in the response to arguments section on page 2 that "One of ordinary skill is aware that a flit is comprised of four bits in parallel computing, which is *ascertaining a remaining communication length for the information for each of the plurality of other channels*" (emphasis in original). Appellant respectfully disagrees. <u>Being aware</u> that a flit is comprised of four bits is not the same as "<u>ascertaining</u> a remaining communication length for the information for each of the plurality of other channels". Nor is receiving four signals of <u>known</u> length the same as "<u>ascertaining</u> a remaining communication length for the information for each of the plurality of other channels". Thus, *Douglas* does not teach or suggest "ascertaining a remaining communication length for the information for each of the plurality of other channels" as recited in claim 1.

(c) *Douglas* does not disclose *"determining a current demand for each of the plurality of other channels ..."*

The Office Action alleges "Douglas disclosed... *determining a current demand for each of the plurality of other channels;* ... column 108, lines 46-56" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> Finally, the node control circuit 1004 also transmits selected error signals, represented by an OUT ERROR signal on FIG. 11A, to the diagnostic network 16 if it detects the presence of selected error conditions.
>
> Each child interface module 1001(i) includes an input child circuit, generally identified by reference numeral 1006(i), and an output child circuit generally identified by reference numeral 1007(i). The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child

> connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel. The C"i" IN FLIT signals received at successive ticks of the NODE CLK signal represent four-bit flits of the data router message packet 30 from the child connected thereto.

(*Douglas* at col. 108, lines 43-56). The Office Action further alleges in the response to arguments section on page 2 that "C'in' IN FLY signals transmitted by each child indicate the amount of flits, or demand, placed upon that child or channel." As such, it appears that the Office Action alleges that receiving C"in" IN FLY signals corresponds to "determining a current demand for each of the plurality of other channels".

However, *Douglas* teaches that "it will be recognized that the input child circuit 1006(i), which receives the C"i" IN FLIT child input flit signals representing flits of data router message packets 30, regulate the flow of flits thereto by means of the C"i" IN FLY child input fly signal" (col. 109, lines 60-64). Appellant respectfully submits that regulating the flow of flits is not the same as "determining a current demand for each of the plurality of other channels". Thus, *Douglas* does not teach or suggest "determining a current demand for each of the plurality of other channels" as recited in claim 1.

(d) *Douglas* does not disclose *"routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation ..."*

The Office Action alleges "Douglas disclosed... *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.* Column 108, lines 57-65" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> The input child circuit 1006(i), in response to the message address portion 31 of the message packet determines whether it is to be transmitted up the tree or down the tree defining the data router 15. If the input child circuit 1006(i) determines that the data router message packet 30 is to be transmitted up the tree, it enables the switch 1003 to direct the

> successive flits comprising the packet 30 to a parent interface module 1002(i) selected by the switch 1003 at random. On the other hand, if the input child circuit 1006(i) determines that the data router message packet 30 is to be transmitted down the tree, it identifies one of the child interface modules 1001(i) to which the switch 1003 is to direct the packet 30. The switch 1003 then directs the successive flits of the message packet 30 to the output child circuit 1007(i) of the identified child interface module 1001(i).

(*Douglas* at col. 108, lines 57-65). The Office Action further alleges in the response to arguments section on page 3 that "In column 108, lines 57-65, the message address portion is reviewed of the packet. The header of the packet was previously established to have priority information in column 108, lines 20-21. The C"i" IN FLIT signals and the child circuits transmits the packets to the appropriate node based upon the message address header and the priority information. This is *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation*" (emphasis in original). Appellant respectfully disagrees.

While *Douglas* teaches that "DECR HGT decrement height signals are used to form the contents of the header field" (col. 108, lines 19-21), *Douglas* does not disclose or suggest that decrement height signals are "a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels". Nor, as discussed above, does *Douglas* teach or suggest that the HEIGHT signals are "priority information <u>for the information</u>". Accordingly, *Douglas* does not disclose or suggest "routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels" as recited in claim 1.

Furthermore, while *Douglas* teaches "The input child circuit 1006(i), in response to the message address portion 31 of the message packet determines whether it is to be transmitted

up the tree or down the tree defining the data router 15" (col. 108, lines 57-60), *Douglas* does not disclose or suggest that the message address portion 31 includes "a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels". Rather, *Douglas* teaches that "message address portion 31 includes a header 40, which identifies the selected maximum level to which the message packet is to be transferred when going up the tree, and a down path identification portion 41 which identifies the path down the tree to the destination leaf 21(y) when going down the tree" (col. 9, lines 24-29). Thus, *Douglas* does not disclose or suggest "routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels" as recited in claim 1.

(e) Summary

For at least the reasons described above, *Douglas* fails to disclose, teach or suggest all of the features recited in claim 1. Therefore, Appellant respectfully submits that the rejection of claim 1 be overturned.

2. <u>Appellants' Claims 2-16</u>

Since independent claim 1 is allowable, Appellant respectfully submits that claims 2-16 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir.1988). Therefore, Appellant respectfully requests that the rejection of claims 2-16 be overturned.

3. <u>Appellants' Claim 17</u>

Appellant's claim 17 provides as follows (emphasis added):

> In a multi-node network comprising a plurality of distributed switching nodes, a method implemented in at least one of the plurality of distributed switching nodes for routing information out of the at least one of the plurality of distributed switching nodes over a first channel from one of a

plurality of other channels, the method comprising:

obtaining priority information for the information entering the node for each of the plurality of other channels;

ascertaining a remaining communication length for the information entering the node for each of the plurality of other channels;

determining a current demand of the first channel; and

routing the information entering at one of the other channels to the first channel based upon an evaluation that considers a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel.

Appellant respectfully submits that independent claim 17 is allowable for at least the reason that *Douglas* does not disclose, teach, or suggest at least the features recited and emphasized above in claim 17.

(a) *Douglas* does not disclose *"obtaining priority information for the information entering the node for each of the plurality of other channels ..."*

The Office Action alleges "Douglas disclosed: *obtaining priority information for the information;* column 108, lines 9-42" (Office Action at page 3; emphasis in original). The Office Action further alleges in the response to arguments section on page 2 that "the HEIGHT signals indicated the level of the data router node to transmit information to." As such, the Office Action appears to allege that the HEIGHT corresponds to priority and appears to point to the node coordinates in support. In addition, it appears that the Office Action is alleging that receiving corresponds to "obtaining" as recited in claim 17. While *Douglas* discloses "HEIGHT (2:0) signals which <u>identify the level of the data router node</u> 22(i,j,k)" (col. 108, lines 12-13; emphasis added), *Douglas* does not teach or suggest that the HEIGHT signals are "priority information <u>for the information</u>" as recited in claim 17. Nor does *Douglas* disclose or suggest that the node coordinates indicate "priority information for the information".

The Office Action further alleges in the response to arguments section on page 2 that "Douglas, column 108, lines 33-42 further indicates a CHILD MAP signal which forces the association of a module in order to couple packets with a child module – in effect, 'a general

indicator related to the urgency of the message, or the need to reach the destination in a timely fashion.'" Specifically, the cited section of *Douglas* teaches:

> The node control circuit 1004 also generates a set of CHILD MAP signals which are coupled to the child interface modules 1001(i) and parent interface modules 1002(i) and are used to force the association of each of the modules 1001(i) and 1002(i) with a particular the child interface module 1001(i) during while the AFD MODE all-fall-down mode signal is asserted. This forces the switch 103 to couple data router message packets 30 received from a particular source, a particular parent or child, to a particular child interface module 1001(i).

(*Douglas* at col. 108, lines 33-42). Appellant respectfully submits that a signal that forces a switch to couple message packets received from a particular source to a particular module is not the same as "priority information for the information" as recited in claim 17. Thus, *Douglas* does not disclose or suggest "obtaining priority information for the information" as recited in claim 17.

(b) *Douglas* does not disclose *"ascertaining a remaining communication length for the information entering the node for each of the plurality of other channels ..."*

The Office Action alleges "Douglas disclosed... *ascertaining a remaining communication length for the information for each of the plurality of other channels;* column 108, lines 47-56" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel.

(*Douglas* at col. 108, lines 50-53). The Office Action further alleges in the response to arguments section on page 2 that "One of ordinary skill is aware that a flit is comprised of four bits in parallel computing, which is *ascertaining a remaining communication length for the information for each of the plurality of other channels*" (emphasis in original). Appellant respectfully disagrees. <u>Being aware</u> that a flit is comprised of four bits is not the same as "<u>ascertaining</u> a remaining communication length for the information for each of the plurality of

other channels". Nor is receiving four signals of <u>known</u> length the same as "<u>ascertaining</u> a remaining communication length for the information for each of the plurality of other channels". Thus, *Douglas* does not teach or suggest "ascertaining a remaining communication length for the information for each of the plurality of other channels" as recited in claim 17.

(c) *Douglas* does not disclose *"determining a current demand of the first channel ..."*

The Office Action alleges "Douglas disclosed... *determining a current demand for each of the plurality of other channels;* **...** column 108, lines 46-56" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> Each child interface module 1001(i) includes an input child circuit, generally identified by reference numeral 1006(i), and an output child circuit generally identified by reference numeral 1007(i). The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel. The C"i" IN FLIT signals received at successive ticks of the NODE CLK signal represent four-bit flits of the data router message packet 30 from the child connected thereto.

(*Douglas* at col. 108, lines 47-56). The Office Action further alleges in the response to arguments section on page 2 that "C'in' IN FLY signals transmitted by each child indicate the amount of flits, or demand, placed upon that child or channel." As such, it appears that the Office Action alleges that receiving C"in" IN FLY signals corresponds to "determining a current demand of the first channel".

However, *Douglas* teaches that "it will be recognized that the input child circuit 1006(i), which receives the C"i" IN FLIT child input flit signals representing flits of data router message packets 30, regulate the flow of flits thereto by means of the C"i" IN FLY child input fly signal" (col. 109, lines 60-64). Appellant respectfully submits that regulating the flow of flits is not the same as "determining a current demand of the first channel". Thus, *Douglas* does not teach or suggest "determining a current demand of the first channel" as recited in claim 17.

(d) *Douglas* does not disclose *"routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation ..."*

The Office Action alleges "Douglas disclosed... *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.* Column 108, lines 57-65" (Office Action at page 4; emphasis in original). The Office Action further alleges in the response to arguments section on page 3 that "In column 108, lines 57-65, the message address portion is reviewed of the packet. The header of the packet was previously established to have priority information in column 108, lines 20-21. The C"i" IN FLIT signals and the child circuits transmits the packets to the appropriate node based upon the message address header and the priority information. This is *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation*" (emphasis in original). Appellant respectfully disagrees.

While *Douglas* teaches that "DECR HGT decrement height signals are used to form the contents of the header field" (col. 108, lines 19-21), *Douglas* does not disclose or suggest that decrement height signals are "a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel". Nor, as discussed above, does *Douglas* teach or suggest that the HEIGHT signals are "priority information <u>for the information</u>". Accordingly, *Douglas* does not disclose or suggest "routing the information entering at one of the other channels to the first channel based upon an evaluation that considers a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel" as recited in claim 17.

Furthermore, while *Douglas* teaches "The input child circuit 1006(i), in response to the message address portion 31 of the message packet determines whether it is to be transmitted up the tree or down the tree defining the data router 15" (col. 108, lines 57-60), *Douglas* does not disclose or suggest that the message address portion 31 includes "a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel". Rather, *Douglas* teaches that "message address portion 31 includes a header 40, which identifies the selected maximum level to which the message packet is to be transferred when going up the tree, and a down path identification portion 41 which identifies the path down the tree to the destination leaf 21(y) when going down the tree" (col. 9, lines 24-29). Thus, *Douglas* does not disclose or suggest "routing the information entering at one of the other channels to the first channel based upon an evaluation that considers a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel" as recited in claim 17.

(e) Summary

For at least the reasons described above, *Douglas* fails to disclose, teach or suggest all of the features recited in claim 17. Therefore, Appellant respectfully submits that the rejection of claim 17 be overturned.

4. <u>Appellants' Claims 18-20</u>

Since independent claim 17 is allowable, Appellant respectfully submits that claims 18-20 are allowable for at least the reason that each depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir.1988). Therefore, Appellant respectfully requests that the rejection of claims 18-20 be overturned.

5. <u>Appellants' Claim 21</u>

Appellant's claim 21 provides as follows (emphasis added):

> A computer readable medium encoded with instructions executable by a processing element node for routing information entering the node over a first channel to one of a plurality of other channels in a multi-node network comprising a plurality of distributed switching nodes, the instructions comprising:
>
> ***logic configured to obtain priority information for the information***;
>
> ***logic configured to ascertain a remaining communication length for the information for each of the plurality of other channels***;
>
> ***logic configured to determine a current demand for each of the plurality of other channels***; and
>
> ***logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.***

Appellant respectfully submits that independent claim 21 is allowable for at least the reason that *Douglas* does not disclose, teach, or suggest at least the features recited and emphasized above in claim 21.

(a) *Douglas* does not disclose *"logic configured to obtain priority information for the information ..."*

The Office Action alleges "Douglas disclosed: *obtaining priority information for the information;* column 108, lines 9-42" (Office Action at page 3; emphasis in original). The Office Action further alleges in the response to arguments section on page 2 that "the HEIGHT signals indicated the level of the data router node to transmit information to." As such, the Office Action appears to allege that the HEIGHT corresponds to priority and appears to point to the node coordinates in support. In addition, it appears that the Office Action is alleging that receive corresponds to "obtain" as recited in claim 21. While *Douglas* discloses "HEIGHT (2:0) signals which <u>identify the level of the data router node</u> 22(i,j,k)" (col. 108, lines 12-13; emphasis added), *Douglas* does not teach or suggest that the HEIGHT signals are "priority information <u>for the information</u>" as

recited in claim 21. Nor does *Douglas* disclose or suggest that the node coordinates indicate "priority information for the information".

The Office Action further alleges in the response to arguments section on page 2 that "Douglas, column 108, lines 33-42 further indicates a CHILD MAP signal which forces the association of a module in order to couple packets with a child module – in effect, 'a general indicator related to the urgency of the message, or the need to reach the destination in a timely fashion.'" Specifically, the cited section of *Douglas* teaches:

> The node control circuit 1004 also generates a set of CHILD MAP signals which are coupled to the child interface modules 1001(i) and parent interface modules 1002(i) and are used to force the association of each of the modules 1001(i) and 1002(i) with a particular the child interface module 1001(i) during while the AFD MODE all-fall-down mode signal is asserted. This forces the switch 103 to couple data router message packets 30 received from a particular source, a particular parent or child, to a particular child interface module 1001(i).

(*Douglas* at col. 108, lines 33-42). Appellant respectfully submits that a signal that forces a switch to couple message packets received from a particular source to a particular module is not the same as "priority information for the information" as recited in claim 21. Thus, *Douglas* does not disclose or suggest "logic configured to obtain priority information for the information" as recited in claim 21.

(b) *Douglas* does not disclose *"logic configured to ascertain a remaining communication length for the information for each of the plurality of other channels ..."*

The Office Action alleges "Douglas disclosed... *ascertaining a remaining communication length for the information for each of the plurality of other channels;* column 108, lines 47-56" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel.

(*Douglas* at col. 108, lines 50-53). The Office Action further alleges in the response to arguments section on page 2 that "One of ordinary skill is aware that a flit is comprised of four bits in parallel computing, which is *ascertaining a remaining communication length for the information for each of the plurality of other channels*" (emphasis in original). Appellant respectfully disagrees. <u>Being aware</u> that a flit is comprised of four bits is not the same as "<u>ascertain</u>[ing] a remaining communication length for the information for each of the plurality of other channels". Nor is receiving four signals of <u>known</u> length the same as "<u>ascertain</u>[ing] a remaining communication length for the information for each of the plurality of other channels". Thus, *Douglas* does not teach or suggest "logic configured to ascertain a remaining communication length for the information for each of the plurality of other channels" as recited in claim 21.

(c) *Douglas* does not disclose *"logic configured to determine a current demand for each of the plurality of other channels ..."*

The Office Action alleges "Douglas disclosed... *determining a current demand for each of the plurality of other channels;* ... column 108, lines 46-56" (Office Action at page 4; emphasis in original). Specifically, in the cited section *Douglas* discloses:

> Each child interface module 1001(i) includes an input child circuit, generally identified by reference numeral 1006(i), and an output child circuit generally identified by reference numeral 1007(i). The input child circuit 1006(i) transmits a C"i" IN FLY child "i" input fly signal to the child connected thereto, and receives C"i" IN FLIT child "i" input flit signals, comprising four signals received in parallel. The C"i" IN FLIT signals received at successive ticks of the NODE CLK signal represent four-bit flits of the data router message packet 30 from the child connected thereto.

(*Douglas* at col. 108, lines 47-56). The Office Action further alleges in the response to arguments section on page 2 that "C'in' IN FLY signals transmitted by each child indicate the amount of flits, or demand, placed upon that child or channel." As such, it appears that the Office Action alleges that receive C"in" IN FLY signals corresponds to "determine a current demand for each of the plurality of other channels".

However, *Douglas* teaches that "it will be recognized that the input child circuit 1006(i), which receives the C"i" IN FLIT child input flit signals representing flits of data router message packets 30, regulate the flow of flits thereto by means of the C"i" IN FLY child input fly signal" (col. 109, lines 60-64). Appellant respectfully submits that regulating the flow of flits is not the same as "determine a current demand for each of the plurality of other channels". Thus, *Douglas* does not teach or suggest "logic configured to determine a current demand for each of the plurality of other channels" as recited in claim 21.

(d) *Douglas* does not disclose *"logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation ..."*

The Office Action alleges "Douglas disclosed... *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.* Column 108, lines 57-65" (Office Action at page 4; emphasis in original). The Office Action further alleges in the response to arguments section on page 3 that "In column 108, lines 57-65, the message address portion is reviewed of the packet. The header of the packet was previously established to have priority information in column 108, lines 20-21. The C"i" IN FLIT signals and the child circuits transmits the packets to the appropriate node based upon the message address header and the priority information. This is *routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation*" (emphasis in original). Appellant respectfully disagrees.

While *Douglas* teaches that "DECR HGT decrement height signals are used to form the contents of the header field" (col. 108, lines 19-21), *Douglas* does not disclose or suggest that decrement height signals are "a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels". Nor, as discussed above, does *Douglas* teach or

suggest that the HEIGHT signals are "priority information for the information". Accordingly, *Douglas* does not disclose or suggest "logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels" as recited in claim 21.

Furthermore, while *Douglas* teaches "The input child circuit 1006(i), in response to the message address portion 31 of the message packet determines whether it is to be transmitted up the tree or down the tree defining the data router 15" (col. 108, lines 57-60), *Douglas* does not disclose or suggest that the message address portion 31 includes "a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels". Rather, *Douglas* teaches that "message address portion 31 includes a header 40, which identifies the selected maximum level to which the message packet is to be transferred when going up the tree, and a down path identification portion 41 which identifies the path down the tree to the destination leaf 21(y) when going down the tree" (col. 9, lines 24-29). Thus, *Douglas* does not disclose or suggest "logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels" as recited in claim 21.

(e) Summary

For at least the reasons described above, *Douglas* fails to disclose, teach or suggest all of the features recited in claim 21. Therefore, Appellant respectfully submits that the rejection of claim 21 be overturned.

6. Appellants' Claim 22

Since independent claim 21 is allowable, Appellant respectfully submits that claim 22 is allowable for at least the reason that it depends from an allowable claim. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir.1988). Therefore, Appellant respectfully requests that the rejection of claim 22 be overturned.

VIII. Conclusion

In summary, it is Appellants' position that Appellants' claims are patentable over the applied cited art references and that the rejection of these claims should be overturned. Appellants therefore respectfully request that the Board of Appeals overturn the Examiner's rejection and allow Appellants' pending claims.

Respectfully submitted,

By: /Randy R. Schoen/

Randy R. Schoen, Reg. No. 62,440

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, L.L.P.
600 Galleria Parkway, SE
Suite 1500
Atlanta, Georgia 30339-5948
Tel: (770) 933-9500
Fax: (770) 951-0933

IX. Claims Appendix under 37 C.F.R. § 41.37(c)(1)(viii)

The following are the claims that are involved in this Appeal.

1. In a multi-node network comprising a plurality of distributed switching nodes, a method implemented in at least one of the plurality of distributed switching nodes for routing information entering the at least one of the plurality of distributed switching nodes over a first channel to one of a plurality of other channels, the method comprising:

obtaining priority information for the information;

ascertaining a remaining communication length for the information for each of the plurality of other channels;

determining a current demand for each of the plurality of other channels; and

routing the information entering at the first channel to one of the plurality of other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.

2. The method of claim 1 further comprising determining a demand for channels coupled to remote nodes between a current node and a destination node and utilizing this priority information in determining a channel over which to route the information entering the at least one of the plurality of distributed switching nodes.

3. The method of claim 1 further comprising obtaining a destination node from a header portion of the information.

4. The method of claim 1, wherein ascertaining the remaining communication length more specifically comprises ascertaining a quantifiable identification of a number of intermediate nodes that the information will traverse before reaching a destination node.

5. The method of claim 1, wherein the obtaining priority information more specifically comprises retrieving a priority indicator from a header portion of the information.

6. The method of claim 1, wherein the obtaining priority information more specifically comprises evaluating a payload portion of the information.

7. The method of claim 1, wherein the ascertaining the remaining communication length comprises receiving and evaluating network information communicated from other nodes in the network.

8. The method of claim 1, wherein the ascertaining the remaining communication length comprises computing the communication length based on *a priori* information about the network.

9. The method of claim 1, wherein the determining the current demand for each of the plurality of other channels comprises evaluating a state of an output queue for each of the other channels.

10. The method of claim 1, wherein the routing the information comprises a substantially balanced weighting of the obtained priority information, the ascertained communication length, and the current demand.

11. The method of claim 1, wherein the routing the information comprises an unbalanced weighting of the obtained priority information, the ascertained communication length, and the current demand.

12. The method of claim 1, wherein the information is embodied in a packet.

13. The method of claim 1, wherein the information is embodied in a flit.

14. The method of claim 1, wherein the information is embodied in a plurality of flits that collectively comprise an information packet.

15. The method of claim 14, wherein the routing is performed on a per-flit basis.

16. The method of claim 14, wherein the routing is performed on a first flit, and remaining flits in information packet are routed to the same other channel as the first flit.

17. In a multi-node network comprising a plurality of distributed switching nodes, a method implemented in at least one of the plurality of distributed switching nodes for routing information out of the at least one of the plurality of distributed switching nodes over a first channel from one of a plurality of other channels, the method comprising:

obtaining priority information for the information entering the node for each of the plurality of other channels;

ascertaining a remaining communication length for the information entering the node for each of the plurality of other channels;

determining a current demand of the first channel; and

routing the information entering at one of the other channels to the first channel based upon an evaluation that considers a combination of the obtained priority information for each of the plurality of other channels, the ascertained communication length for each of the plurality of other channels, and the current demand for the first channel.

18. The method of claim 17, further comprising determining a demand for channels coupled to remote nodes between a current node and a destination node and utilizing this information in determining a channel over which to route the information entering the at least one of the plurality of distributed switching nodes.

19. The method of claim 17, wherein the routing the information comprises a substantially balanced weighting of the obtained priority information, the ascertained communication length, and the current demand.

20. (Original) The method of claim 17, wherein the routing the information comprises an unbalanced weighting of the obtained priority information, the ascertained communication length, and the current demand.

21. A computer readable medium encoded with instructions executable by a processing element node for routing information entering the node over a first channel to one of a plurality of other channels in a multi-node network comprising a plurality of distributed switching nodes, the instructions comprising:

logic configured to obtain priority information for the information;

logic configured to ascertain a remaining communication length for the information for each of the plurality of other channels;

logic configured to determine a current demand for each of the plurality of other channels; and

logic configured to route the information entering at the first channel to one of the other channels based upon an evaluation that considers a combination of the obtained priority information, the ascertained communication length for each of the plurality of other channels, and the current demand for each of the plurality of other channels.

22. The computer readable medium of claim 21, wherein the logic configured to route the information is configured to route the information based upon a substantially balanced weighting of the obtained priority, the ascertained communication length, and the current demand.

X. Evidence Appendix under 37 C.F.R. § 41.37(c)(1)(ix)

None.

XI. Related Proceedings Appendix under 37 C.F.R. § 41.37(c)(1)(x)

None.